

WHAT IS CLAIMED IS:

1 1. A dielectric substrate having a multiturn inductor comprising:

2 a) a multilayer dielectric body comprising a plurality of layers;

3 b) a multiturn inductor buried within the dielectric body, each
4 turn of the inductor comprising a bottom portion, a top portion and
5 two side portions, the bottom portion and top portion being
6 parallel and in different layers of the dielectric body, the side
7 portions being parallel to each other and extending between the top
8 and bottom portions and comprising vias in the dielectric body.

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11 2. The dielectric substrate of claim 1 wherein the top and bottom
12 portions comprise lines situated in respective layers of the
13 dielectric body.

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16 3. The dielectric substrate of claim 2 wherein the top and bottom
17 portions each comprise two parallel lines in juxtaposition.

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20 4. The dielectric substrate of claim 3 further comprising vias
21 connecting the parallel lines of each of the top and bottom
22 portions.

1 5. The dielectric substrate of claim 4 wherein the vias connecting
2 the parallel lines are only at the ends of the lines.

1 6. The dielectric substrate of claim 4 wherein the vias connecting
2 the parallel lines are spaced along the length of the lines.

1 7. The dielectric substrate of claim 1 wherein the turns of the
2 multiturn inductor form a toroidal shape.

1 8. The dielectric substrate of claim 1 wherein the multiturn
2 inductor is tunable by tapping the multiturn inductor at selected
3 locations.

1 9. The dielectric substrate of claim 8 further comprising deleting
2 a portion of the multiturn inductor.

1 10. The dielectric substrate of claim 1 wherein the multiturn
2 inductor is tunable by adding at least one additional buried loop
3 to the multiturn inductor.

1 11. The dielectric substrate of claim 1 wherein the multiturn
2 inductor is tunable by adding a plate adjacent to the multiturn
3 inductor, the plate being electrically isolated from the multiturn
4 inductor.

1 12. The dielectric substrate of claim 1 wherein the multiturn
2 inductor is tunable by adding a plate adjacent to the multiturn
3 inductor, the plate being electrically connected to the multiturn
4 inductor.

1 13. The dielectric substrate of claim 1 wherein the multiturn
2 inductor is a first multiturn inductor and further comprising a
3 second buried multiturn inductor near the first multiturn inductor
4 but electrically isolated therefrom, the first and second multiturn
5 inductors cooperating to form a transformer.

1 14. A method of forming a dielectric substrate having a multiturn
2 inductor, the method comprising the steps of:

3 a) obtaining a plurality of layers;

4 b) forming conductive lines on a first group of layers;

5 c) forming conductive vias in a second group of layers;
6 d) forming conductive lines on a third group of layers;
7 e) stacking at least one layer from the second group of layers on
8 at least one layer from the third group of layers; and
9 f) stacking at least one layer from the first group of layers on
10 the at least one layer from the second group of layers wherein the
11 stacking of the first, second and third groups of layers form an
12 inductor buried within a dielectric substrate.

13 15. The method of claim 14 wherein the respective layers are
14 greensheets and the inductor and dielectric substrate are
15 unsintered and further comprising the step of: g) sintering the
16 unsintered dielectric substrate having an unsintered inductor
17 buried therein to form a dielectric substrate having a multiturn
18 inductor buried therein.

1 16. The method of claim 14 wherein there are a plurality of layers
2 from each of the first and third group of layers.

1 17. The method of claim 14 wherein there are a plurality of layers
2 from the second group of layers.

1 18. The method of claim 14 wherein the vias in the second group of
2 layers contact the conductive lines in the first and third group of
3 layers only at the ends of the conductive lines.

1 19. The method of claim 14 wherein the vias in the second group of
2 layers contact the conductive lines in the first and third group of
3 layers along the length of the conductive lines.

1 20. The method of claim 14 wherein the multiturn inductor is in the
2 form of a toroidal shape.
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